

Attachment 1

Scope of Work, Specifications & Drawings

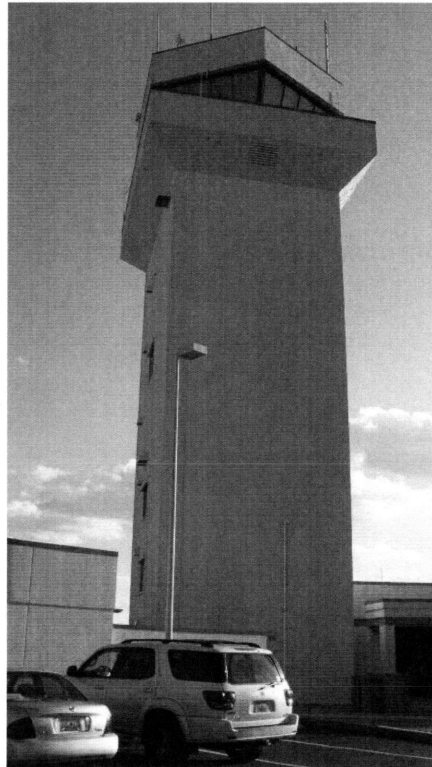
DTFAEN-12-R-00014

**Repair Roof at the Myrtle Beach Air Traffic Control Tower
(ATCT) and Terminal Radar Approach Control
(TRACON),
Myrtle Beach, South Carolina**

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
SOUTHERN REGION
Atlanta, Georgia

SPECIFICATION NO. FAA-SO-
DATED: March 10, 2012

SPECIFICATION FOR the WATERPROFING OF THE
AIR TRAFFIC CONTROL TOWER & BASE BUILDING
AT **MYRTLE BEACH AIRPORT, 3242 Tower Street,**
MYRTLE BEACH, SOUTH CAROLINA, 29577



FAA-SO-XXXX
March 12, 2012

DIVISION 1 GENERAL REQUIREMENTS

SECTION 1A

SUMMARY OF THE WORK

1A.1 GENERAL: The work described hereunder consists of furnishing all necessary materials, labor, equipment, tools, and supervision to Water proof the Air Traffic Control Tower (ATCT) and Base Building at Myrtle Beach Airport, Myrtle Beach, SOUTH CAROLINA.

1A.2 SCOPE OF WORK: The work consists of but is not limited to the following:

Base Building(main, link and entrance roofs):

1. Remove and reinstall lighting protection from the base building roof.
2. Clean surface and slice the existing membrane that is going to be reroof for that day.
3. Remove the membrane from the parapet wall and existing cap.
4. Install a single ply 80 mils PVC thermoplastic with felt back mechanical attached roof system with a design speed warranty of 120 mph.
5. Install fully adhered thermoplastic membrane on the parapet wall and covers it with membrane coated metal cap with all their seams heat welded.
6. Install walkway pad in the same area as the existing.
7. Remove and replace all the flashing with fully adhered membrane flashing with bar and sealant per manufacturer recommendations.
8. Install pvc metal coated insert drain scuppers.

Cab Roof:

1. Remove the existing roof and substrate all the way to the concrete deck.
2. Remove six inch at the base of cab parapet wall EIFS, metal counter flashing and replace it with a new removable counter flashing with new six inch of eifs section that match the existing
3. Install a 2" X 6"wood nailer perimeter, with two inch layer of polyisocunurate (iso)board.
4. Remove and reinstall any cable for the lightning arresters, associated clamps and cables on cab roof.
5. Furnish and install 80 mils Engineered mechanically attached, single-ply, PVC roof system. Included in this work are all flashings, sealants, adhesives, walkway pads around

- the roof perimeter and the hatch to the perimeter area, and other components to comprise a complete roofing system.
5. The Thermoplastic mechanical roof system should be design speed warranty of 120 mph with a 20 year warranty.
 6. Install four pitch pocket for the lightning base support and two insert for the scuppers.
 7. Install walkway pad around the perimeter of the cab.

Alternate (option)
Catwalk

1. **All the exterior catwalk floor with Bituminous coating needs to be removed, replace it with a liquid roof coating system and the cab sprinkler spray pump with appurtenances relocated as shown in the drawings. The the liquid roof system should be a 10 year warranty.**
- 1A.3 COORDINATION: All coordination between the Contractor and the FAA shall be through the project Resident Engineer.
 - 1A.4 TEMPORARY FACILITIES: The Contractor shall furnish all temporary facilities as required such as electricity, water, and air.
 - 1A.5 SANITARY FACILITIES: Sanitary facilities are not available at the site. The contractor shall provide temporary toilet facilities as required for his workmen. Temporary toilet facilities shall be of the type approved by the local governing body. The location of the toilet facilities shall be as directed by the Resident Engineer.
 - 1A.6 MATERIALS: The Contractor shall furnish all materials, equipment, and labor to complete the job, unless otherwise specified.
 - 1A.7 MATERIAL STORAGE: The Contractor shall store all materials in a manner to protect them from all elements of the weather and other incidental damage. Materials shall be stored as directed by the Resident Engineer.
 - 1A.8 INGRESS AND EGRESS TO WORK AREAS: Ingress and egress to the work areas shall be as directed by the Resident Engineer. Security passes will be required of all workmen. Information on how to obtain these passes will be available at the pre-construction conference. The Contractor shall keep all vehicles, working equipment and materials where directed by the Resident Engineer.

1A.9 CLEANING:

- A. Working Area: The Contractor shall keep the working area in a clean and proper condition. All rubbish and waste resulting from the execution of the work shall be removed at the end of each day or stored as directed by the COTR.
- B. Waste Packing Material: Immediately after unpacking, all packing material, case lumber, excelsior, or other rubbish, flammable or otherwise, shall be removed from the building and the premises.
- C. Final Clean-Up: Upon completion of work, and before final inspection, the Contractor shall remove his working tools, equipment, debris, rubbish, and unused materials from the building site.
- D. Disposal: Disposal of rubbish, and debris will be off the site at Contractor's expense or as directed by the Resident Engineer.

1A.10 CONTRACTOR'S LIABILITY: Damage to existing facilities and equipment caused by the Contractor shall be reported to the Resident Engineer without delay. The Contractor will be responsible for repairing, or having repaired, all damaged areas or equipment at the Contractor's expense. All repairs shall be accomplished to the satisfaction of the resident Engineer. The Contractor shall keep all his working personnel within the work area or in approved access routes.

1A.11 SITE VISIT: The Contractor shall visit the work site prior to bidding the job to verify all dimensions and quantities of materials as specified and to obtain first-hand knowledge of existing conditions. Contractors can contact the Ivory Cooper MYR System Service Center Manager at 843-238-1850 to arrange for a site visit. No subsequent extras will be allowed due to any claim of lack of knowledge for conditions which can be determined by examining the site. Once the Contractor is chosen to do the job, additional claims for materials, equipment, and labor for represented scope of work areas will not be allowed, unless the FAA has a need for additional work to be accomplished.

1A.12 PERMITS: The Contractor shall be responsible for obtaining all permits required to complete the job at no expense to the FAA.

- 1A.13 PRE-CONSTRUCTION CONFERENCE: The Contractor shall attend a pre-construction conference prior to starting work at a location agreed upon between the Contractors and the Contracting Officer.
- 1A.14 WORKMANSHIP: All work shall be accomplished by experienced workers in accordance with the highest standards of the various work trades involved.
- 1A.15 FACILITY OPERATION: The antennas located on the cab roof provide communication for live air traffic, are of the highest importance, and shall not be disturbed. Prior to commencing work, the Contractor shall coordinate with the Resident Engineer to make all of the Contractor's personnel aware of these antennas and their importance.
- 1A.16 RESTRICTED USE OF ASBESTOS CONTAINING MATERIAL (ACM):
- A. Requirements: Contractor shall not use any asbestos containing material (ACM) at any time during the construction process. Contractor shall verify that all material, including that from third party suppliers, is asbestos free materials. The Contractor shall provide a written letter of certification to the FAA, stating that the project is asbestos free.
- 1A.17 FACILITY OPERATION: Working around and above the cab window frame, and on the catwalk surrounding the cab, requires coordination with Air Traffic personnel so as to cause no disruptions to air traffic. Prior to commencing work, the Contractor shall coordinate with the Resident Engineer to make all of the Contractor's personnel aware of these requirements and their importance.

Even when sufficient advance notice is received from the Contractor and agreed to at that time, the FAA can make no guarantees for opportunities to proceed with the Work. Every effort will be given the Contractor to accommodate the work schedule, but some delay could be anticipated.

1A-18 CONTRACTOR'S WARRANTY

The Contractor shall guarantee all materials and workmanship under his contract against defects or incorrect installation for a period of 1 year after completion. Repair or replacement of any defective

materials, correction of faulty workmanship, or correction of any items not in accordance with the manufacturer's specifications or directions and these specifications shall be made at the Contractor's expense.

1A-19 MANUFACTURER'S WARRANTY

The single ply PVC roofing membrane material shall withstand 120 mph wind loading and guaranteed against defects by the manufacturer to be leak-free for a period of 20 years after completion. The warranty shall be without any financial limitation in case of roof replacement. Also, the manufacturer shall submit a roof plan showing the seams and bar location for the roof system that will conform to the requirements and withstand 120 mph wind loading. This warranty shall identify the FAA as the owner of the facility. The location and effective starting date of warranty shall be indicated. All labor, materials, and travel expenses incurred to make the necessary repairs under warranty shall be at no cost to the FAA.

Except the Catwalk liquid roof system that is 10 years warranty.

SECTION 1B
WORK SCHEDULE

1B.1 WORK SCHEDULE: Working hours will be eight-hour days, Monday through Friday, with a start time agreed upon at the pre-construction conference. Some of the interior work will be done after hours trying to reduce noise level to atct personal. For bid purpose the interior work and catwalk demolition will be done at night. Contractor shall submit a work schedule for approval prior to beginning work. The Contractor shall keep the Resident Engineer advised daily of any change.

SECTION 1C
SUBMITTALS

1C.1 SUBMITTALS AND BRAND NAME USAGE

Submittals Prior to Contract Award Shall Include:

1. Letter from the proposed primary system manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

- A. Introduction: Each product required for use in the Contract drawings and Specifications must meet the actual minimum needs of the Government as demonstrated in the salient characteristics for that product. If a brand name product is used in the drawings or Specifications, it should be regarded as a "known acceptable source". The use of the term "known acceptable source" and "brand name or equal" in referencing a specific product or manufacturer is not intended to indicate a preference for the products mentioned, but indicates the quality and characteristics of products that will meet the Government requirements. Should the Contractor decide to use a product other than that identified as a "known acceptable source" or "brand name or equal", the Contractor shall provide a submittal for this product. This does not relieve the Contractor from providing submittals for products or materials required in other sections of this Specification.

A brand name product or known acceptable source mentioned is not required for use unless the drawings and Specifications make it clear that the brand name product is required, and substitution is prohibited.

- B. Requirements: Each product that a Contractor wishes to use that is not a known acceptable source, must be approved before use, by the Contracting Officer or his/her designee. To gain approval, the Contractor must submit documents and/or samples that will demonstrate the product clearly will meet the Government's minimum needs, and demonstrates appropriate salient characteristics. All submittals must be in writing. The information presented in a submittal shall be sufficient to demonstrate that all specification requirements for the subject material, equipment, methods, or plans, are met by the Contractor's proposal.

The Contractor shall submit for approval samples of each material to be used in the roof system, including each component manufacturer's literature and applicable MSDS. This is to include (but not limited to) applicable product literature, sample guarantee, detailed drawings of proposed flashing applications where they will differ from the project drawings, and fastening for insulation and membrane. Deviations from contract drawings and specifications shall be submitted in writing to the Contracting Officer prior bid opening for approval by the Project Engineer. The Contractor, as part of the bid, shall submit to the Contracting

Officer a company "Site Health and safety Plan" for review and approval.

- A. Submittal Review: Contractor shall send the submittal package(s) directly to the Contracting Officer. The submittal will return directly from the Contracting Officer to the Contractor, with the Contracting Officer's approval, approval with comments, or disapproval.
- D. Submittal Approval Time Frame: To provide adequate time for document review, the FAA reserves the right to take the necessary time to complete a review. It should be anticipated that the review period may be two weeks, although every effort will be made to expedite this process.
- E. Procurement Before Approval: The Contractor is advised not to procure any item for which submittal approval is required but not yet granted. If approval is denied, the Contractor will not be paid for the disapproved item(s). The Contractor must transmit a new submittal package for the new items replacing the disapproved items, and must procure only approved items. The Contractor shall take responsibility for any items purchased, fabricated, or delivered before submittal approval is granted.

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
SECTION 7A
INSULATION

7A.1 SCOPE OF WORK: Install two inch of insulation board, fully adhered to the concrete deck.

7A.2 MATERIALS: Fasteners and insulation boards shall be approved by the membrane manufacturer. The Contractor shall supply samples and brochures to the Contracting Officer for approval.

- A. Fasteners: Fastener length shall be field determined by the Contractor, ensuring at least a 1 inch penetration of the concrete deck in the cab and metal deck at the base building. Fasteners shall meet the Factory mutual Specification #4470. Recommended Source: Roofgrip fasteners, S-12, #12 diameter, by "Buildex".
- B. Distribution Plates: The distribution plates shall be three inch diameter corrosion resistant metal plates, meet FM#4470, and are made from Galvalume metal. The only acceptable plastic plate is Gearlock Plastic made from high strength Polyolefin, with special design features that positively lock the fastener's head into the plate. This plastic plate is manufactured by Buildex. No substitutions will be allowed for plastic plates unless the roofing manufacturer warrants it. The Contractor is required to submit from the roofing manufacturer, their approval to use this plate and that the plate meets all their requirements.
- C. Rigid Insulation Board: Polyisocyanurate foam core bonded to a glass fiber mat facers and approved by the membrane manufacturer for a mechanically attached membrane system meeting the Factory Mutual I-125 uplift requirement. The rigid insulation sheets shall be 4 feet by 4 feet have an average R value of 14 using the ASTM C518 test at 75°F. The insulation must meet the following typical physical properties:

<u>Property</u>	<u>Test Method</u>	<u>Typical Results</u>
Dens., Overall	ASTM D 1622	2.0 pcf (nom.)
Comp. Strength	ASTM D 1621	25 psi

Flame Spread	ASTM E 84	25 or less
Moisture Vapor Transmission	ASTM E 96	Less than 1 perm.
Dim. Stability	ASTM D2126	Less than 2% linear change
Service Temp.	----	-40°F to +250°F

The Contractor shall have the roofing membrane manufacturer's approval and the Contracting Officer's approval prior to ordering the insulation material.

Two manufacturers and insulation materials that are acceptable to the FAA and meet the typical physical properties are as follows:

NRG ENERGY 1 with MG 1279 or GAF ULTRA Facers
RMAX MULTIMAX FA with GAF ULTRA Facer

- D. Oly bond adhesive: OlyBond500 is a fast-acting, dual component low rise polyurethane adhesive that is applied using the specially designed patented PaceCart2 Dispenser. Oly Bond 500 is used to adhere a variety of board stocks to most common roof substrates in both new and reroof applications. It can also be used to adhere insulation board to concrete deck, and in temperatures of 40°F and higher.

- 7A.3 INSTALLATION: Install insulation sheets using the appropriate Olybond Adhesive as shown on the drawings. The fastener location pattern shall be approved by the manufacturer and meet the uplift and wind loading requirements.

The insulation joints shall not be wider than 1/8". When insulation is cut to fit irregular shapes, the insulation shall be cut to fit the desired shape accurately with true square edges. The insulation layers shall be adhered to the deck. The layout, pattern for the adhesive will be recommended by the rigid insulation manufacturer and membrane manufacturer must be complied with for a mechanically fastened-engineered roof system.

SECTION 7B
SINGLE-PLY PVC ROOFING MEMBRANE

7B.1 SCOPE OF WORK: The work covered by this section is for an engineered bar system mechanically attached, .080 inch thick with polyester felt back for the base building roof area and none felt back membrane for the cab roof single-ply Polyvinyl Chloride (PVC) membrane, with hot air welded seams.

7B.2 MATERIALS:

- A. Single-Ply Membrane: Membrane shall be reinforced flexible PVC sheeting, .080 inches thick, conforming to the ASTM D4434 (latest revision) "Standard for Polyvinyl Chloride Sheet Roofing." PVC membrane used for flashing shall be fully adhered with hot-air welded joints. The roofing system shall include compatible flashing, caulking, etc., as recommended by the roofing manufacturer. **Engineered System by Sika Sarnafil, Canton, MA 02021**

The proposal of a different system requires the following Contractor submittals:
Roofing system manufacturer's catalog and specification data, complete with materials descriptions, detailed application instructions, standard installation drawings, detailed drawings where applicable, walkway material details, product characteristics, physical properties, and a copy of the 20 year warranty. The warranty shall be without any financial limitation in case of roof replacement. Also, the manufacturer shall submit a roof plan showing the seams and bar location for the roof system that will conform to the requirements and withstand 120 mph wind loading. Felt back can be replace with .25 dens deck mechanically attached. Engineered System by Sika Sarnafil, Canton, MA 02021

Acceptable substitution: **90 mils KEE Fibertite at XT 20 year's warranty, 120 mph wind warranty. Seaman Corporation(Fibertite), Wooster, Ohio 44691**

As manufactured, the membrane shall conform to the following physical properties:

Table 1

Salient Characteristics of Reinforced
Single-ply Polyvinyl Chloride (PVC) Membrane

<u>Parameters</u>	<u>Test Method</u>	<u>Typical Properties</u>
Reinforcing Mat'l	---	Polyester
Overall Thk. mm (in)	D751	2.03 (.080)
Breaking Str., lbf/in	D751	230
Elong. at Break, min. %	D751	20%
Seam Strength* (% of Breaking Str.)	D751	85%
Retention of Props. after Heat Aging	D3045	----
Breaking Strength (% of Original)	D751	95%
Elongation, min. (% of Original)	D751	90%
Tear Resistance (lbf)	D751	50
Low Temp. Bend (-40°F)	D2136	Pass
Accelerated Weath. Test (Xenon)	D2565	10,000 Hours
Cracking	----	None
Discoloration	----	Negligible
Crazing	----	None
Linear Dim. Change	D1204	.1%
Weight Change After Immersion in Water	D570	2.5%
Static Puncture Resist, 33 lbf	D5602	Pass
Dynamic Puncture Resist, 14.7 ft-lbf	D5635	Pass

*Failure occurs through membrane rupture, not seam failure.

B. Separation Layer: Separator used to isolate new roofing materials from existing roofing membrane shall be a .0135 unsaturated polyester felt, having a minimum Mullen burst strength of 210 pounds. A known acceptable product is Sarnafelt.

C. Flashing Material:

1. Base and counter flashing material shall be

"PVC metal", 25 gauge galvanized steel, coated with a 0.021 inch coating of PVC film or equal. This material shall be used on the parapet walls, and walls as required on the drawings. Flashing color shall match roofing membrane.

2. Flashing for the curbs and other details shall be made from PVC fiberglass reinforced membrane, a minimum of .048 inches thick. Flashing color shall match roofing membrane.
3. Asphalt resistant membranes such as Sarnafil membrane G459 (.060 inches thick) or equal, can be used for flashing around and under the roof drain clamping rings and other areas where there could be contact with asphalt.

D. Protection Mat: The Contractor shall install polyester-reinforced walkway tread made from PVC membrane, 0.096 inches thick. The walkway tread shall protect the roofing membrane from mechanical abuse in the walkways. Sarnatred is a known acceptable source.

E. Adhesives:

1. Sarnafil Sarnacol 2121 water-based, elastomeric adhesive, or equal, shall be used to attach the PVC roofing membrane to the substrate specified
2. Sarnafil Sarnacol 2170 solvent-based, elastomeric adhesive, or equal, shall be used for roof flashings only if deemed necessary by the Resident Engineer.

F. Fasteners: All exposed screws, fasteners or miscellaneous hardware shall be stainless steel alloy, bronze, PVC coated steel, hot dipped galvanized, or similar corrosion resistant material approved by the Project Engineer.

G. Bar: 14-gage, "U" shape, roll formed, corrosion resistant steel bar. This is being used to mechanically attach the single ply membrane. The bar shall be fastened 8" O.C., or the recommended spacing by the manufacturer.

H. Sealants (Caulking): Caulking shall be chemically

compatible with the PVC flashing membrane. The following caulks/sealants are accepted based on chemical compatibility with PVC membranes.

1. Sonneborn NP-1 by Chemrex, Inc.
2. Silpruf by General Electric Co.
3. Vulkem 116 by Mameco International
4. Vulkem 921 by Mameco International
5. NP1
6. PTI-404 by Protective Treatments, Inc.
7. ACRYL-R S-M5522 by Schnee Morehead
8. SM-205 by TACC International
9. Tremseal-S by Tremco
10. Mono by Tremco
11. Multipurpose Sealant by Sarnafil, Inc.

I. Caulking For Drain. Apply Tremco Poly Roof, or approved equal, in the roof drain bowls to seal the underside of the PVC material used to line the roof drains.

J. Wood Nailer

Treated wood nailers shall be installed into the structural purlins at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project Drawings. Thickness of nailers must match the insulation thickness to achieve a smooth transition. Wood nailers shall be treated for fire and rot resistance (wolmanized or osmose treated) and be #2 quality or better lumber. Creosote or asphalt-treated wood is not acceptable. Wood nailers shall conform to Factory Mutual Loss Prevention Data Sheet 1-49. All wood shall have a maximum moisture content of 19% by weight on a dry-weight basis. The nailer shall be nail to the deck 24" O.C

Plywood

When bonding directly to plywood, a minimum 1/2 inch (12 mm) CDX (C side out), smooth-surfaced exterior grade plywood with exterior grade glue shall be used. Rough-surfaced plywood or high fastener heads will require the use of felt behind the flashing membrane. Plywood shall have a maximum moisture content of 19% by weight on a dry weight basis.

7B.3 WEATHER LIMITATIONS: Roofing or insulation materials shall not be applied until the ambient temperature is 50°F with no signs or forecast for rain. Roofing

materials shall not be applied when there is excessive moisture in the air causing wet or damp surfaces.

- 7B.4 QUALITY ASSURANCE: The roofing system shall be Factory Mutual approved for use over metal roof deck, Class I roof construction, and shall have 120 mph windstorm resistance classification. The roof system shall warranted by the manufacturer to withstand at least 120-mph winds.
- 7B.5 PRODUCT DELIVERY AND STORAGE: All products delivered to the site shall be in original unopened containers. Store membrane rolls lying down, fully protected from moisture. Bonding adhesives shall be stored at a temperature above 40°F. All stored materials shall be protected from damage during construction by the Contractor.
- 7B.6 MEMBRANE INSTALLATION:
- A. Inspection: Contractor shall examine the surface scheduled to receive the membrane for defects that will adversely affect the execution and quality of work.
 - B. Preparation: The surface to receive the membrane shall be dry and free from dust or loose particles which would interfere in obtaining proper and adequate bond? Score the existing membrane along the perimeter of the parapet wall and at all penetrations, as well as the six radial lines that emanate from the parapet wall.
 - C. Substrate Preparation.
 - 1. A proper substrate shall be provided to receive the membrane and mechanically attached system.
 - 2. The Contractor shall inspect the roofing surface for defects such as excessive surface roughness, contaminated surfaces, structurally unsound substrates etc., that will adversely affect the quality of work.
 - 3. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.

D. Installation:

1. Unroll the roof membrane over the properly installed and prepared substrate surface. Overlap adjacent sheets with the manufacturer's minimum overlap required for bar attachment and welding techniques.
2. Place bars as indicated on drawings and/or manufacturer's design.
3. Bars and PVC cord are to be used at the base of curbs, parapet walls and penetrations.
4. Install an 8-inch cover strip over each bar and then hot-air welds on both sides.
5. Bar installation shall be positioned at proper intervals according to an approved layout using the manufacturer calculations. A ¼-inch gap shall be left where bar ends meet to accommodate expansion and contraction. The bar shall be secured at an approved fastener spacing. Fasteners shall be no more than 3 inches from the ends of each bar. An additional 4-inch square piece of membrane shall be welded over the tops of bars where the ends meet.
6. Around all perimeters, at base of walls, drains, curbs, vent pipes, or any other penetration protruding through the roof, bars shall be installed. Where bars meet a ¼-inch gap must be allowed for expansion and bar ends are covered with 4-inch strips of membrane.
7. A 4-mm PVC cord shall be welded on the penetration side of the bar to prevent tearing through of the roof membrane.
8. Hot-air weld overlaps according to manufacturer's recommendations.
9. The membrane is to be attached with accepted fasteners and bars according to manufacturer's specifications and details.
10. Membrane overlaps shall be shingled with the flow of water.

E. Securement Around Perimeter and Rooftop Penetrations.

1. Around all perimeters, at base of walls, drains, curbs, vent pipes, or any other penetrations, bars shall be installed. Fasteners shall be installed according to the manufacturer's instructions. Fasteners should be installed using the fastener manufacturers recommended tools with depth locators.
2. Membrane flashings shall extend 4 inches past the bars and be hot-air welded to the membrane deck sheet.
3. A 4-mm PVC cord shall be welded on the penetration side of the bar to prevent tearing through of the membrane.

F. Adhesive Application: Only if required for roof flashing, use an adhesive (Sarnacol 2170 or approved equivalent) and prime the surface to receive the membrane. If the Contractor opts to use an adhesive on the cab roof, he shall notify the Resident Engineer. All vents and openings must be sealed with polyethylene sheeting and duct tape to prevent fumes from entering occupied areas of the Air Traffic Control Tower.

1. Apply adhesive (Sarnacol 2170 or approved equivalent) at a rate of 1-3/4 gallons per 100 square feet to the substrate surface.
2. Apply adhesive in a smooth even coating with no holidays, globs, and puddles. The adhesive shall be allowed to dry completely prior to installing the membrane.
3. When the adhesive on the substrate is dry, the 0.080-inch PVC membrane is unrolled. Adjacent sheets shall be overlapped a minimum 6 inches.
4. Once in place, half of the sheet's length shall be coated with adhesive (Sarnacol 2170 or approved equivalent) at a rate of 1/2 gallon per 100 square feet. When the adhesive has dried sufficiently to produce strings, when touched with a dry finger, the

coated membrane shall be carefully rolled onto the previously coated substrate to avoid wrinkles. Do not allow adhesive on the underside of the PVC roof membrane to dry completely. The amount of membrane that may be coated with adhesive before rolling onto the substrate will be determined by ambient temperature, humidity, and manpower.

5. The bonded sheet shall be pressed firmly into place with a weighted foam-covered lawn roller. The remaining unbounded half of the sheet shall be folded back and the bonding procedure repeated.

Drying time increases with cooler temperatures. Also, the Contractor is cautioned against work on days of high humidity because of the extremely slow evaporation of the solvent. Contractor shall check with the roofing system manufacturer's representative on days of high humidity.

- G. The membrane shall be smooth and free from wrinkles, air bubbles, puckers, and similar irregularities that leaves an unsightly appearance. Laid membrane not acceptable to the Resident Engineer shall be replaced or repaired in a manner that is acceptable to him/her.
- H. The Contractor shall install the reinforced PVC membrane with strips as long as possible in order to minimize the number of end laps and short pieces that leave the appearance of a patchwork quilt.
- I. No bonding adhesive shall be applied in the 4-inch lap area to be hot air welded. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques.

7B.7 Hot-Air Welding of Lap Areas: Prior to hot-air welding operations, the Contractor shall notify the Resident Engineer. All vents and openings must be sealed with polyethylene sheeting to prevent fumes from entering occupied areas of the Air Traffic Control Tower.

- A. General:

1. Adjacent sheets shall be welded in accordance with the manufacturers written instructions. All side and end laps shall be hot-air welded. Lap area shall be a minimum of 3 inches wide when machine welding, and a minimum of 4 inches wide when hand welding.
 2. Equipment shall be provided by or approved by the manufacturer. All mechanics intending to use the equipment shall be adequately trained prior to welding.
 3. All surfaces to be welded shall be clean and dry according to manufacturer recommendations. No adhesive shall be present within the lap areas.
- B. Hand Welding: Hand welded seams shall be completed in three stages. Equipment shall be allowed to warm up for at least one minute prior to the start of welding.
1. The lap shall be tack welded every 3 feet to hold the seam in place. When hand welding laps of mechanically attached field and perimeter sheets, tack welding is not acceptable. Use weights or metal tracks to hold the seam in place for welding.
 2. The back edge of the lap shall be welded with a thin, continuous weld to prevent loss of hot air during the final welding.
 3. The hot-air nozzle shall be inserted into the lap, keeping the welding equipment at a 45 degree angle to the side lap. Once the proper welding temperature has been reached and the material starts to flow, the hand roller shall be applied at a right angle to the welding gun and pressed lightly. For straight laps, the 1 ½-inch wide nozzle shall be used. For corners and compound connections, the ¾-inch wide nozzle shall be used.
- C. Machine Welding: Machine welded seams may be achieved by the use of various automatic welding equipment. When using this equipment, the manufacturer's instructions shall be followed and

local codes for electric supply, grounding and overcurrent protection observed. The automatic welding machines require 218 to 230 volts at 30 to 40 amps. The use of a portable generator is recommended.

- D. Quality Control of Welded Seams: All completed welded seams shall be checked after cooling for continuity using a rounded screwdriver or other suitable blunt object. Visible evidence that welding is proceeding acceptably is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of black material from the edges of completed joints. As directed by the Resident Engineer, the Contractor shall make daily on-site evaluations of the welded seams. Two-inch wide cross-section samples shall be taken through completed seams. Correct welds will display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Contractor at no additional charge to the FAA.

7B.8 Walkway Tread Installation: The Contractor shall install walkway tread made from PVC membrane, .096 inches thick, reinforced with polyester-reinforced mat or approved equal. Walkways are to be installed as shown in the base building drawing and over the entire cab roof.

A. Walkway Tread Installation:

1. Roofing membrane to receive walkway tread shall be clean and dry.
2. Snap chalk lines on deck sheet to indicate location of walkway treads.
3. Walkway tread shall be unrolled and positioned within chalk lines and fully adhered the field of the walkway treads except the 4in outside edge perimeter.
4. Hot-air weld the 4 in perimeter of the walkway tread to the deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies.

7B.9 Base building cap shall be pvc metal: All cap shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be

allowed without the prior written approval of the Resident Engineer and the roofing membrane manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the new roofing due to incomplete flashings, the affected area shall be removed and replaced at the Contractor's expense.

- A. PVC metal cap shall be formed and installed per the detail drawings.
- B. All metal flashings shall be fastened according to Sarnafil details to withstand 120 mph winds.
- C. Adjacent caps of PVC metal shall be spaced 1/4 inch apart. The ends of the Sarnafil metal shall be fastened 6 inches on center. The joint shall be covered with a 2-inch wide aluminum tape. A 4-inch wide strip of Sarnafil G410 flashing membrane shall be hot-air welded over the joint.

7B.10 Metal Flashings:

- A. Metal details, fabrication practices, and installation methods shall conform to the applicable requirements of the following:
 - 1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
 - 2. Sheet Metal and Air Conditioning Contractors National Association Inc. (SMACNA -- latest issue).
- B. Metal, other than that provided by Roofing Manufacturer, is not covered under the Manufacturer warranty.
- C. Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.
- D. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
- E. Metal joints shall be watertight.
- F. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 1/4 inches.

- G. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches on center into the wood nailer or masonry wall.
- H. Counterflashing shall overlap base flashings at least 4 inches.

7B.11 Membrane Flashings:

- All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Resident Engineer. Approval shall only be for specific locations on specific dates. Flashings shall be fully adhered to compatible, dry, smooth and solvent-resistant surfaces.
- A. Over the properly installed and prepared substrate surface, contact adhesive shall be applied using approved solvent-resistant paint rollers. The adhesive shall be applied at a rate of approximately 1 1/2 to 2 1/2 gallons per 100 square feet of surface depending upon substrate. The adhesive shall be applied in smooth, even coatings with no holidays, globs, puddles or similar irregularities. Only an area which can be completely covered in that day's operations shall be coated with adhesive. The surface with adhesive coating shall be allowed to dry completely prior to installing the membrane.
 - B. When the surface is dry, the flashing membrane is cut to a workable length and the underside shall be evenly coated with adhesive at a rate of 1/2 gallon per 100 sq. ft. When the adhesive has dried sufficiently to produce strings when touched with a dry finger, the coated membrane shall be rolled onto the previously coated substrate being careful to avoid wrinkles.
 - C. No bonding adhesives shall be applied in lap areas that are to be welded to flashings or adjacent sheets. All sheets shall be applied in the same manner, lapping all sheets as required by welding techniques.
 - D. All flashing membranes shall be fully adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place, No

bituminous elements shall be in contact with the membrane.

- E. All flashings shall be hot-air welded at their joints and at their connections with the roof membrane.
- F. All flashing membranes shall be mechanically fastened along the top edge through tin discs spaced a maximum of 1 foot on center, or predrilled metal strips. Expansion pins with nylon sheaths set in predrilled holes shall be used to secure flashings to masonry and concrete surfaces.

7B.12 Temporary Cut-Off:

- A. All flashing shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. When a break in the day's work occurs in the central area of a roof, a temporary waterstop shall be constructed to provide a 100% watertight seal. When work on the new system is suspended, the stagger of the insulation joints shall be maintained by installing partial fillers. The new membrane shall be carried into the waterstop. The waterstop shall be sealed to the substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of roof cement 6 inches wide, or use 1 inch wide night sealant as a substitution for the asphalt cement. Upon resumption of work, the contaminated PVC membrane shall be cut out. All contaminated areas, membrane, insulation fillers, etc., shall be removed from the work area and disposed of.
- B. If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition.
- C. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at Contractor's expense.

7B.13 Field Quality Control: All welds shall be tested for continuity by running a rounding edge screwdriver along the membrane joints after cooling. Any

discontinuities shall be re-welded. Positive evidence of good welding is characterized by an uninterrupted extrusion of melted black material from the joint. The Contractor is responsible to have the manufacturers inspector inspect the roof before the installation of the walkway tread membrane takes place.

- 7B.14 CONTRACTOR'S WARRANTY: The Contractor shall supply the FAA with a minimum 1-year workmanship warranty. In the event any work related to roofing, flashing, or metal work is found to be defective or otherwise not in accordance with the contract documents within two years of completion, the Contractor shall remove and replace at no cost to the FAA.
- 7B.15 MANUFACTURER'S WARRANTY: The single-ply roofing membrane material shall be guaranteed against defects by the manufacturer and be leaking free for a period of 20 years after completion. This warranty shall identify the FAA as owner of the facility. The location and effective starting date of warranty shall be indicated. The warranty shall be without any financial limitation in case of roof replacement.

The Contractor shall not be responsible for damage to the roof from extreme weather conditions such as tornadoes, lightning strikes, large hail, or damage caused by maintenance people working on the roof surface.

In the event water penetrates the roof system for reasons of either workmanship or material, the Contracting Officer will notify the Contractor in writing, within the 1-year workmanship warranty period, after the discovery of the failure, defect, or damage. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the FAA shall have the right to replace, repair, or remedy the failure at the Contractor's expense.

After the 1-year workmanship warranty period, the Contracting Officer will contact the manufacturer directly.

All labor, materials, and travel expenses incurred to make the necessary repairs under the warranty period shall be at no cost to the FAA.

SECTION 7C
SECTION 07180 LIQUID ROOF SYSTEM
PART 1 GENERAL

1.01 SCOPE OF WORK. Remove the existing bituminous system product for the catwalk area, all the way to concrete surface, cut, repair, prime and coat with liquid roof System.

1.04 SUBMITTALS

A.Submittals Prior to Contract Award:

1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the Manufacturer's requirements in order to qualify the project for the specified guarantee.

1.05 QUALITY ASSURANCE

- A. Acceptable Contractor: Contractor shall be certified in writing by the waterproofing materials manufacturer to install this waterproofing products.
- B. Project Acceptance: Submit a completed manufacturer's application for roof guarantee form along with shop drawings of the roofs showing all dimensions, penetrations, and details. The form shall contain all the technical information applicable to the project including deck types, roof slopes, base sheet and/or insulation assemblies proposed for installation. The form shall also contain accurate and complete information requested including proper names, addresses, zip codes and telephone numbers. The project must receive approval by the membrane manufacturer, through this process, prior to shipment of materials to the project site.

1.06 GUARANTEE/WARRANTY

- A. Roof Membrane Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's ten year labor and materials membrane guarantee. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall

be issued at no additional cost to the Owner. This guarantee shall not exclude random areas of ponding from coverage.

> Siplast Parapro ten year Roof Membrane Guarantee

1.07 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: Store closed containers in a cool, dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Do not store resins at temperatures below 32°F (0°C) or above 85°F (29°C). Keep away from open fire, flame or any ignition source. Store in a well ventilated area.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing fumes when above the Threshold Limit Value (TLV). Do not eat, drink, or smoke in areas where materials are stored or applied.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected, removed and replaced at the Contractor's expense.

1.08 PROJECT/SITE CONDITIONS

A. Requirements Prior to Job Start

1. Notification: Give a minimum of 5 day's notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.

2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

3. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by

OSHA, NIOSH, NRCA and other industry or local governmental groups. Workers shall wear a long sleeve shirt with long pants and work boots. Workers shall use only butyl rubber or nitrile gloves when mixing or applying PMMA products. Safety glasses with side shields are required for eye protection. Use local exhaust ventilation to maintain worker exposure below the published Threshold Limit Value (TLV). If the airborne concentration poses a health hazard, becomes irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements published under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentration. A filtering face piece or dust mask is not appropriate for use with this product if TLV filtering levels have been exceeded.

B. Environmental Requirements

1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions - asphalt: At ambient temperatures of 40°F (4°C) and below, take precautions to ensure that the specified Type IV asphalt maintains a minimum acceptable 400°F (204°C) at the point of sheet application. Do not overheat asphalt to compensate for cold conditions. The use of insulated handling equipment is strongly recommended. Hot luggers, mop carts, and kettle-to-roof supply lines should be insulated. Hand mops should be constructed with a smaller yarn head to facilitate short moppings. Luggers and mop carts should never be more than half filled at all times.

3. Temperature Restrictions - self-adhesive sheets: The minimum required substrate temperature at point of application is 40°F (4°C). Maintain a minimum roof membrane material temperature above 50°F (10°C). In low temperature conditions, materials should be kept warm prior to application. Suspend application in situations where the self-adhered base ply cannot be kept at temperatures allowing for proper adhesion.

4. Temperature Restrictions - PMMA-based Materials: Do not apply catalyzed resin materials if there is a threat of inclement weather. Follow the resin manufacturer's specifications for minimum and maximum ambient, material and

substrate temperatures. Do not apply catalyzed resin materials unless temperatures fall within the resin manufacturer's published range.

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Primer: An asphalt, solvent blend conforming to ASTM D 41 Type I or II requirements and meeting local VOC regulations.

- > PA-1125 Asphalt Primer by Siplast; Irving, TX
- > PA-917 LS Asphalt Primer by Siplast; Irving, TX

B. Self-Adhesive Modified Bitumen Ply Sheet: A self-adhesive, fiberglass reinforced, SBS modified bitumen coated sheet having a minimum weight of 76 lb/sq. The back of modified bitumen ply sheet shall be coated with factory applied polymer modified asphalt self-adhesive stripes staggered diagonally on the back surface of the sheet with an acrylic coating applied between the stripes to provide a bonded area of 50% of the total surface area. The top surface of the modified bitumen ply sheet shall be coated with a proprietary acrylic coating.

- > Paradiene 20 TS SA P by Siplast; Irving, TX

C. Self-Adhesive Modified Bitumen Ply Sheet: A self-adhesive, fiberglass reinforced, SBS modified bitumen coated sheet having a minimum weight of 72 lb/sq. The top surface of the modified bitumen ply sheet shall be coated with a proprietary acrylic coating.

Paradiene 20 SA P by Siplast; Irving, TX

D Modified Bitumen Ply Sheet: A torch applied, fiberglass reinforced, SBS modified bitumen coated sheet having a minimum weight of 76 lb/sq. The modified bitumen base ply shall be coated with factory applied asphalt-adhesive strips staggered diagonally on the back surface of the sheet to provide a bonded area of 50% of the total surface area. The top surface of the modified bitumen ply sheet shall be coated with a proprietary acrylic coating.

Paradiene 20 TS P by Siplast; Irving, TX

H. Modified Bitumen Ply Sheet: A torch grade, fiberglass reinforced, SBS modified bitumen coated sheet having a

minimum weight of 76 lb/sq. The top surface of the modified bitumen ply sheet shall be coated with a proprietary acrylic coating.

Paradiene 20 TG P, by Siplast; Irving, TX

I. Modified Bitumen Ply Sheet: A fiberglass mat reinforced modified bitumen sheet, coated on one side with a high quality SBS modified bitumen blend, having a minimum weight of 62 lb/sq. The top surface of the modified bitumen ply sheet shall be coated with a proprietary acrylic coating.

Siplast Paradiene 20 P

J. Elastomeric Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials. Acceptable types are as follows:

PS-304 Elastomeric Sealant by Siplast; Irving, TX

K. Cleaner/Solvent: A clear solvent used to prepare metal and plastic surfaces prior to application of the catalyzed resin flashing membranes and to reactivate transition areas of in-place catalyzed resin flashing membranes at tie-ins and between staged coats of resin.

Pro Prep by Siplast; Irving, TX

L. PMMA Primers

1. PMMA Primer for Concrete/Masonry/Wood/Plywood Substrates: A two-component, PMMA-based primer for use over concrete, concrete repair materials, masonry substrates and wood/plywood substrates.

Pro Primer W by Siplast; Irving, TX

2. PMMA Primer for Concrete Substrates: A two-component, PMMA-based primer for use over concrete substrates.

Pro Primer T by Siplast; Irving, TX

3. PMMA Primer for Asphaltic Substrates: A two-component, PMMA-based primer for use over asphaltic materials.

Pro Primer R by Siplast; Irving, TX

M. Preparation Paste: A multi-component, PMMA based paste used for remediation of depressions in substrate surfaces or other irregularities.

Pro Paste Resin by Siplast; Irving, TX

N. Repair Mortar: A two-component, PMMA based, aggregate filled mortar used for remediation of depressions or patching concrete substrates.

Pro Repair Mortar by Siplast; Irving, TX

O. Tape: A white, flexible, coated cotton cloth tape designed for treatment of insulation panel joints and deck/wall transitions.

Pro Tape by Siplast; Irving, TX

P. Reinforced PMMA Membrane/Flashing System Components

1. Catalyst: A reactive agent used to induce curing of polymethylmethacrylate (PMMA) resins.

Pro Catalyst by Siplast; Irving, TX

2. Resin for Flashing Applications: A multi-component, flexible, polymethylmethacrylate (PMMA) based resin combined with a thixotropic agent for use in combination with fleece fabric to form a monolithic, reinforced flashing membrane.

Parapro 123 Flashing Resin by Siplast; Irving, TX

3. Resin for Field Membrane Construction: A multi-component, flexible, polymethylmethacrylate (PMMA) based resin for use in combination with fleece fabric to form a monolithic, reinforced roofing membrane.

Parapro Roof Resin by Siplast; Irving, TX

4. Fleece for Membrane and Flashing Reinforcement: A non-woven, 110 g/m², needle-punched polyester fabric reinforcement as supplied by the membrane system manufacturer.

Pro Fleece by Siplast; Irving, TX

5. Color Finish Resin: A pigmented, multi-component, flexible, polymethylmethacrylate (PMMA) based resin for

use as a wearing coat over the field of the finished roof membrane to provide a desired color finish.

Pro Color Finish by Siplast; Irving, TX

6. Clear Finish Resin: A clear, multi-component, flexible, polymethylmethacrylate (PMMA) based resin for use as a wearing coat over colored quartz.

Pro Clear Finish by Siplast; Irving, TX

7. Thixotropic Agent: A liquid additive used to increase the viscosity of the PMMA resin products, allowing the resins to be applied over sloped areas.

Pro Thixo by Siplast; Irving, TX

Q. Anti-Skid Surfacing

1. Natural Quartz: A natural-colored, kiln-dried, quartz aggregate suitable for broadcast into the PMMA based wearing layer.

Pro Natural Quartz by Siplast; Irving, TX

2. Colored Quartz: A pigment-coated, kiln-dried, quartz aggregate suitable for broadcast into the PMMA based wearing layer.

Pro Colored Quartz by Siplast; Irving, TX

3. Ceramic Granules: No. 11 grade specification ceramic granules suitable for broadcast into the PMMA based wearing layer.

No. 11 Granules by Siplast; Irving, TX

PART 3 EXECUTION

3.01 SUBSTRATE EXAMINATION/PREPARATION

A. General: Ensure that substrates are free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles/friable matter, rust or any other material that would be detrimental to adhesion of the catalyzed primer and/or resin to the substrate. Some surfaces may require scarifying, sandblasting, or

grinding to achieve a suitable substrate. Wipe surfaces with a clean cloth saturated with the specified preparation liquid to remove grease, oils or dust that may affect adhesion and to cured PMMA surfaces to receive a subsequent coat of resin.

B. Moisture Evaluation: Evaluate the level of moisture in the substrate to determine that moisture levels are acceptable for application of specified roofing system. Concrete substrates to receive a application of the specified PMMA roofing system shall have a maximum moisture content of 6% and be prepared as required to provide acceptable adhesion of the membrane.

C. Adhesion Testing for Concrete Substrates to Receive Resin Materials: Test the concrete substrate using a device conforming to ASTM D 4541 using a 50 mm dolly adhered with the specified catalyzed primer. Utilize the same concrete preparation methods as that which will be used prior to application of the waterproofing for areas to be evaluated for adhesion. Ensure that a minimum adhesion value of 220 psi is obtained before application of the waterproofing system. If multiple areas are involved in the scope of work, evaluate each area.

D. Preparation of Existing Concrete/Masonry Substrates to Receive Resin Materials: Existing concrete substrates shall have a minimum hardness of 3,500 psi (24 N/mm²). Shot-blast or scarify concrete or masonry surfaces to provide a sound substrate free from laitance and residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion. Prepare the concrete surface to generate a concrete surface profile of CSP-2 to CSP-4 as defined by the ICRI.

* NOTE: In cases where the PMMA roofing system is to be applied directly to a concrete substrate without a modified bitumen base ply, the Contractor must carefully verify the suitability of the concrete. As with any roofing system applied directly over a concrete substrate, high moisture content may result in poor adhesion or blistering of the membrane system.

E. Static Crack and Cold Joint Preparation: Prime cracks and joints with the specified PMMA primer and fill cracks and joints using the specified preparation paste prior to membrane/flashing application. Commence

membrane and flashing application immediately following catalyzation of the preparation paste.

* NOTE: Select a specific base sheet application method to meet individual project requirements. Contact Siplast for further information regarding base sheet fastening diagrams for field, corner and perimeter zones.

F. Concrete Substrate Repair: Prime areas of the concrete substrate intended for repair using the specified PMMA primer. Fill the areas using the specified paste or repair mortar and allow to catalyze. Follow the paste or repair mortar manufacturer's published minimum and maximum product thickness limitations per lift.

3.02 MIXING OF RESIN PRODUCTS

- A. Preparation/Mixing/Catalyzing Aggregate-Filled Resin Products: Pour the entire desired quantity of resin into a clean container and slowly add the pre-measured quantity of aggregate using a spiral mixer or mixing paddle, stirring the mixture for the time period specified by the resin manufacturer. If catalyst is not a component of the aggregate mixture, calculate the amount of catalyst powder needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin/aggregate mixture. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. Ensure that air is not entrained into the product during the mixing process. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before expiration of resin pot life.
- B. Preparation/Mixing/Catalyzing Resin Products: Pour the desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir the liquid for the time period specified by the resin manufacturer. Calculate the amount of catalyst powder needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin component. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. Ensure that air is not entrained into the product during the mixing process. To avoid aeration, do not use a spiral mixer

unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before expiration of resin pot life.

3.03 PREPARATION PASTE AND PRIMER MIXING/APPLICATION

- A. Primer Application: Apply primer resin using a roller or brush at the minimum rate specified by the primer manufacturer over poured reinforced concrete substrates. Apply primer resin using a roller or brush at the increased rate specified by the primer manufacturer over DensDeck, DensDeck Prime, and granule surfaced membrane substrates. Increase application rates over other absorbent substrates. Do not let resin pool or pond. Do not under-apply or over-apply primers as this may interfere with proper primer catalyzation. Make allowances for saturation of roller covers and application equipment.
- B. Paste Application: Allow the primer to set and apply catalyzed preparation paste using a trowel.

3.04 FLASHING AND FIELD MEMBRANE APPLICATION

A. Base Flashing Application

- 1. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to set.
- 2. Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.
- 3. Apply an even, generous base coat of flashing resin using a roller at the minimum rate specified by the resin manufacturer to prepared surfaces requiring flashing coverage. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin at the minimum rate specified by the resin manufacturer immediately following embedment of the fleece, ensuring full saturation of the fleece. Ensure that the flashing resin is applied to extend a 0.25 inch

(6 mm) beyond the fleece. Remove the tape before the catalyzed resin sets. Make allowances for saturation of roller covers and application equipment.

4. Should work be interrupted for more than 12 hours or the surface of the catalyzed resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.

B. Field Membrane Application

1. Using the specified cleaner/solvent, wipe flashing membrane surfaces to be lapped with field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.
2. Apply an even, generous base coat of field membrane resin using a roller at the minimum rate specified by the resin manufacturer to prepared surfaces. Work the fleece into the wet, catalyzed resin using a roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin at the minimum rate specified by the resin manufacturer immediately following embedment of the fleece, ensuring full saturation of the fleece. Make allowances for saturation of roller covers and application equipment. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

C. Color Finish Application

1. Apply the color finish over the installed field membrane after the membrane is set, dry and has been in place for a minimum 2 hours.
2. Using the specified cleaner/solvent, wipe field membrane surfaces to receive the color finish layer. Allow the surface to dry for a minimum 20 minutes before continuing work.
3. Apply an even top coat of catalyzed color finish resin at the minimum rate specified by the resin manufacturer. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

3.05 WALKTREAD/SKID RESISTANT SURFACING

A. Quartz/Granule Anti-Skid Application: Utilize masking tape to outline the areas to receive the anti-skid system. Apply an additional top coat of the catalyzed roof resin at the minimum rate specified by the resin manufacturer; and broadcast quartz/granules before the resin sets. Remove tape before the resin sets. Apply a clear or color coat of resin if required by the roofing system manufacturer.

3.06 FIELD QUALITY CONTROL AND INSPECTIONS

A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.

B. Notification Of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection

1. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance Of The Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

1.06 PRODUCT DELIVERY STORAGE AND HANDLING

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

B. Storage: Store closed containers in a cool, dry, well ventilated area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Keep products away from open fire, flame or any ignition source. Store temperature sensitive products at temperatures recommended by the manufacturer. Quartz silica (sand) must be kept dry during storage and handling.

- C. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be rejected, removed and replaced at the Contractor's expense.
- D. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing fumes. Do not eat, drink, or smoke in the application area. Workers shall wear long sleeve shirts, long pants and work boots. Workers shall wear butyl rubber or nitrile gloves when mixing or applying this product. Safety glasses with side shields shall be used for eye protection. Use local exhaust ventilation to maintain worker exposure below TLV as listed on MSDS for respective products. If the airborne concentration poses a health hazard, becomes irritating or exceeds recommended limits, use a NIOSH approved respirator in accordance with OSHA Respirator Protection requirements under 29 CFR 1910.134. The specific type of respirator will depend on the airborne concentration. A filtering face piece or dust mask is not acceptable for use with this product if TLV filtering levels have been exceeded.

1.07 PROJECT/SITE CONDITIONS

A. Requirements Prior to Job Start

1. Notification: Give a minimum of 5 days notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.
3. Safety: Familiarize every member of the application crew with safety regulations recommended by OSHA and other industry or local governmental groups.

B. Environmental Requirements

1. Precipitation: Do not apply materials during precipitation or in the event there is a probability of precipitation during application. Take adequate

precautions to ensure that materials, applied membrane, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions - PMMA-based Materials: Do not apply catalyzed resin materials if there is a threat of inclement weather. Follow the resin manufacturer's specifications for minimum and maximum ambient, material and substrate temperatures. Do not apply catalyzed resin materials unless ambient and substrate surface temperatures fall within the resin manufacturer's published range.

C. Protection Requirements

1. Protection: Provide protection against staining and mechanical damage for newly applied waterproofing and adjacent surfaces throughout this project.
2. Limited Access: Prevent access by the public to materials, tools, and equipment during the course of the project.
3. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.
4. Site Condition: Complete, to the Owner's satisfaction, all job site clean-up including building interior, exterior, and landscaping where affected by the construction.
5. The access door needs to be seal from the inside and outside to control any fumes or dust to the interior of the cab area.

SECTION 7D
CAULKING

7C.1 Scope of Work: The extent of work is indicated on the drawings and by the requirements of this section.

7C.2 Materials: The caulking shall be chemically compatible with the PVC flashing membrane and must match the membrane in color:

A. Surrounding Area. Caulking shall be compatible with the PVC flashing and roofing membrane.

Materials shall be delivered to the job in sealed containers with manufacturer's original label attached. All materials shall be prime and used according

to the manufacturer's printed instructions.

Materials shall not exceed the manufacturers stated shelf life. Acceptable products are:

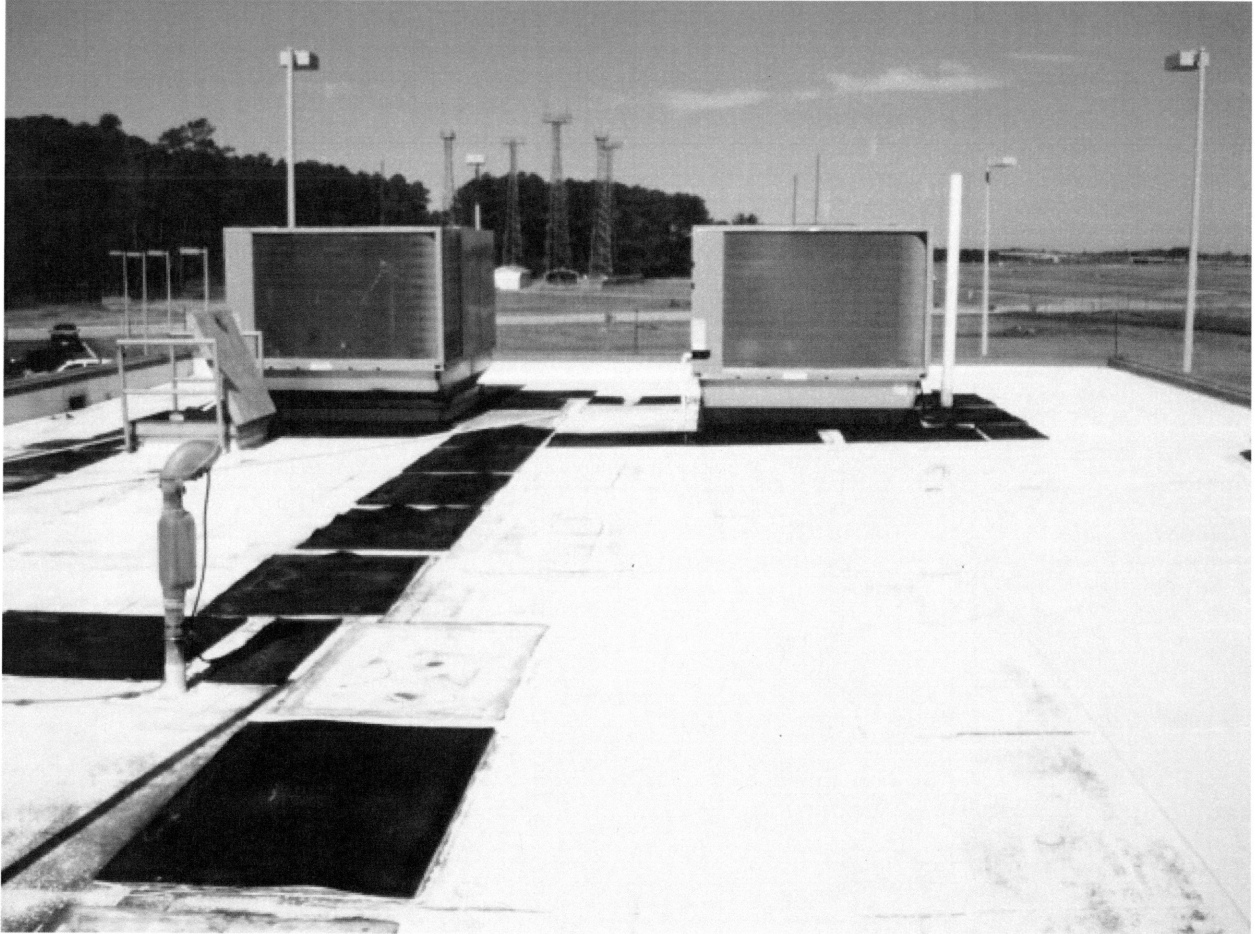
1. Sonneborn NP-1 by Chemrex, Inc.
2. Silpruf by General Electric Co.
3. Vulkem 116 by Mameco International
4. Vulkem 921 by Mameco International
5. Pecora 60+ by Pecora Corporation
6. PTI-404 by Protective Treatments, Inc.
7. ACRYL-R S-M5522 by Schnee Morehead
8. SM-205 by TACC International
9. Tremseal-S by Tremco
10. Mono by Tremco
11. Multipurpose Sealant by Sarnafil, Inc.

7C.3 Application: Caulking shall be applied at the consistency in the temperature range, and in the manner recommended by the manufacturer. In all cases, the amount of exposed caulking shall be kept at a minimum and tooled to present a professional finished appearance.

ATTACHMENT 5

SITE PHOTOGRAPHS

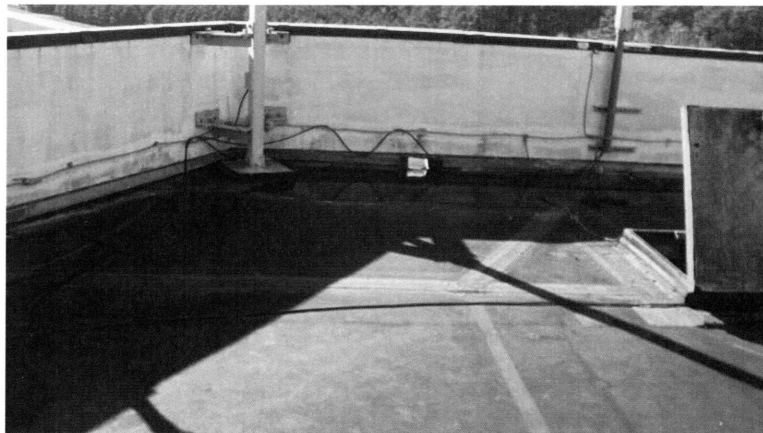
BASE BUILDING ROOF



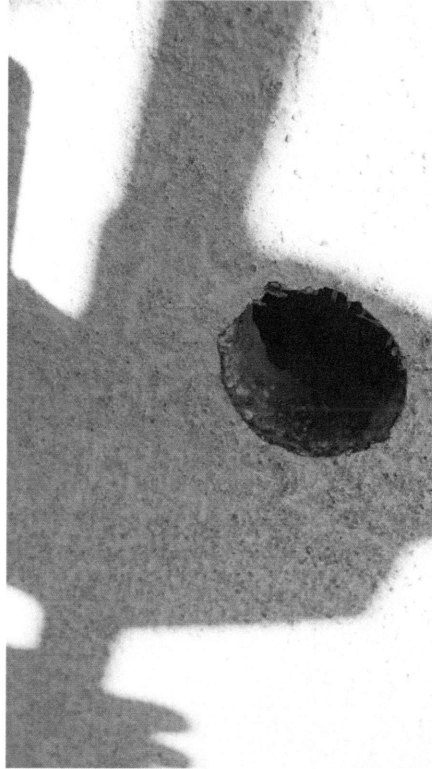
VIEW OF THE BASE BUILDING ROOF WITH A-C UNITS AND ROOF
PENETRATION



VIEW OF THE CATWALK ROOF SURFACE.



VIEW OF THE CAB ROOF



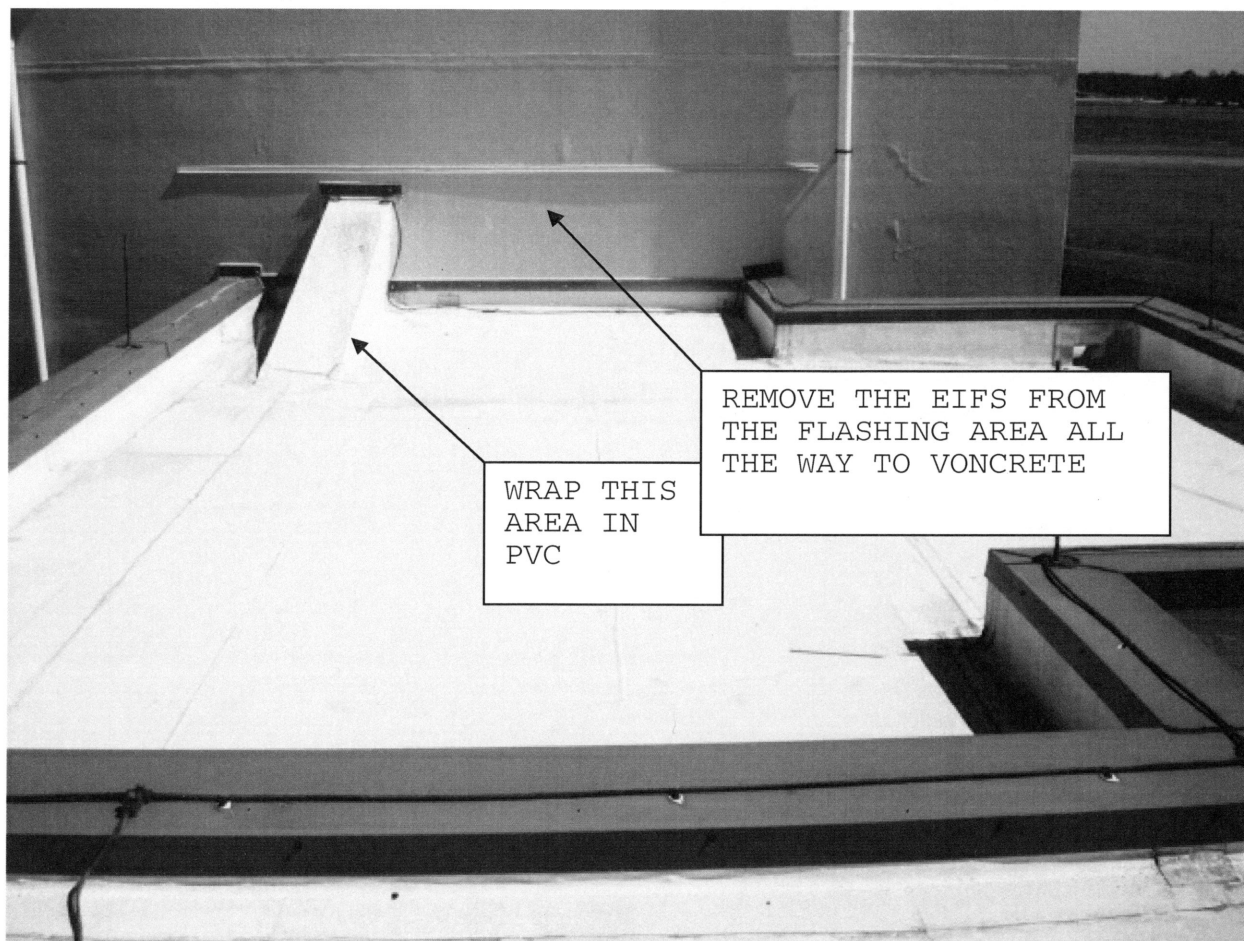
VIEW OF THE CAB ROOF PARAPET WALL CORE HOLE



VIEW OF THE CAB ROOF CORE SAMPLE



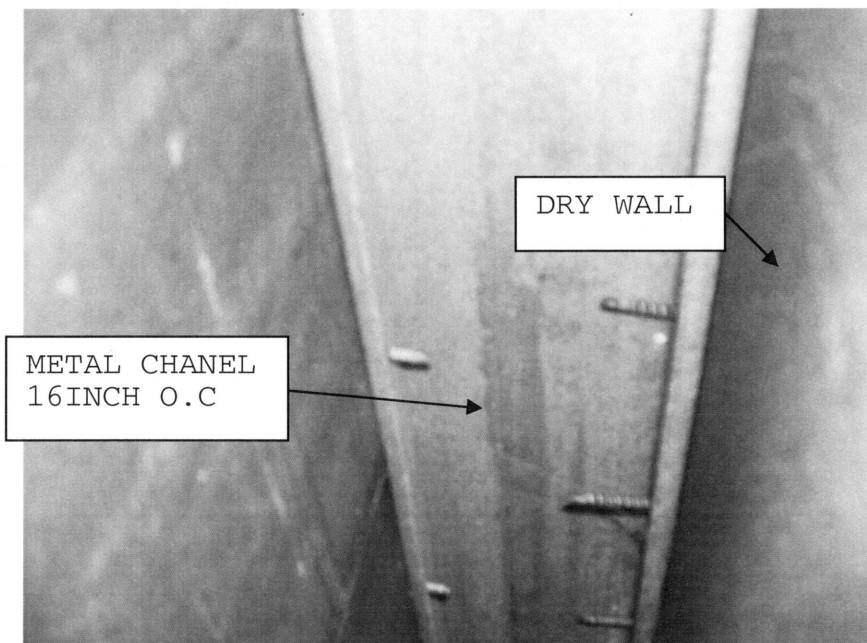
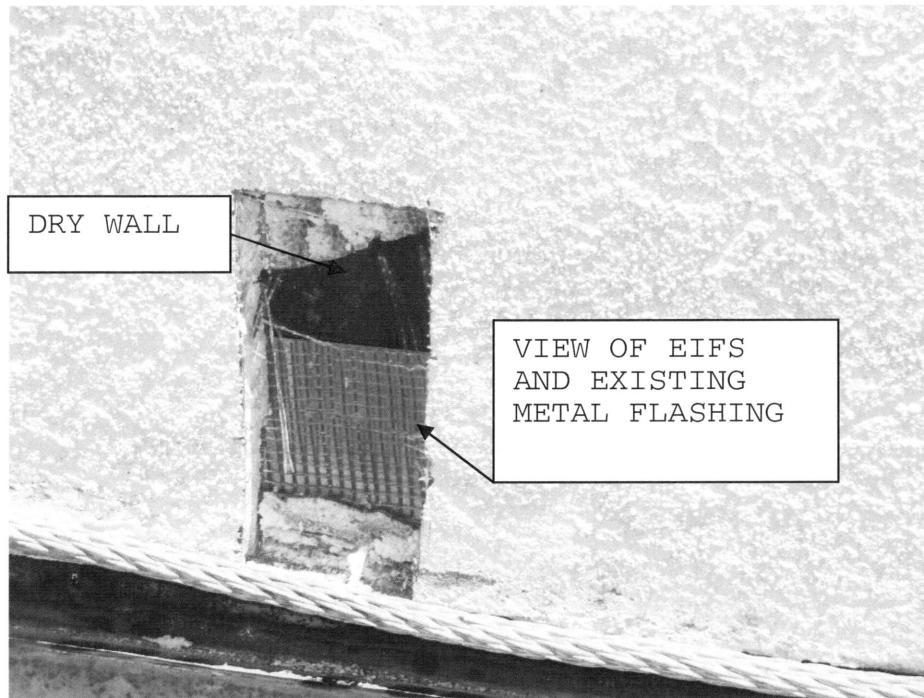
VIEW OF THE ENTRANCE ROOF



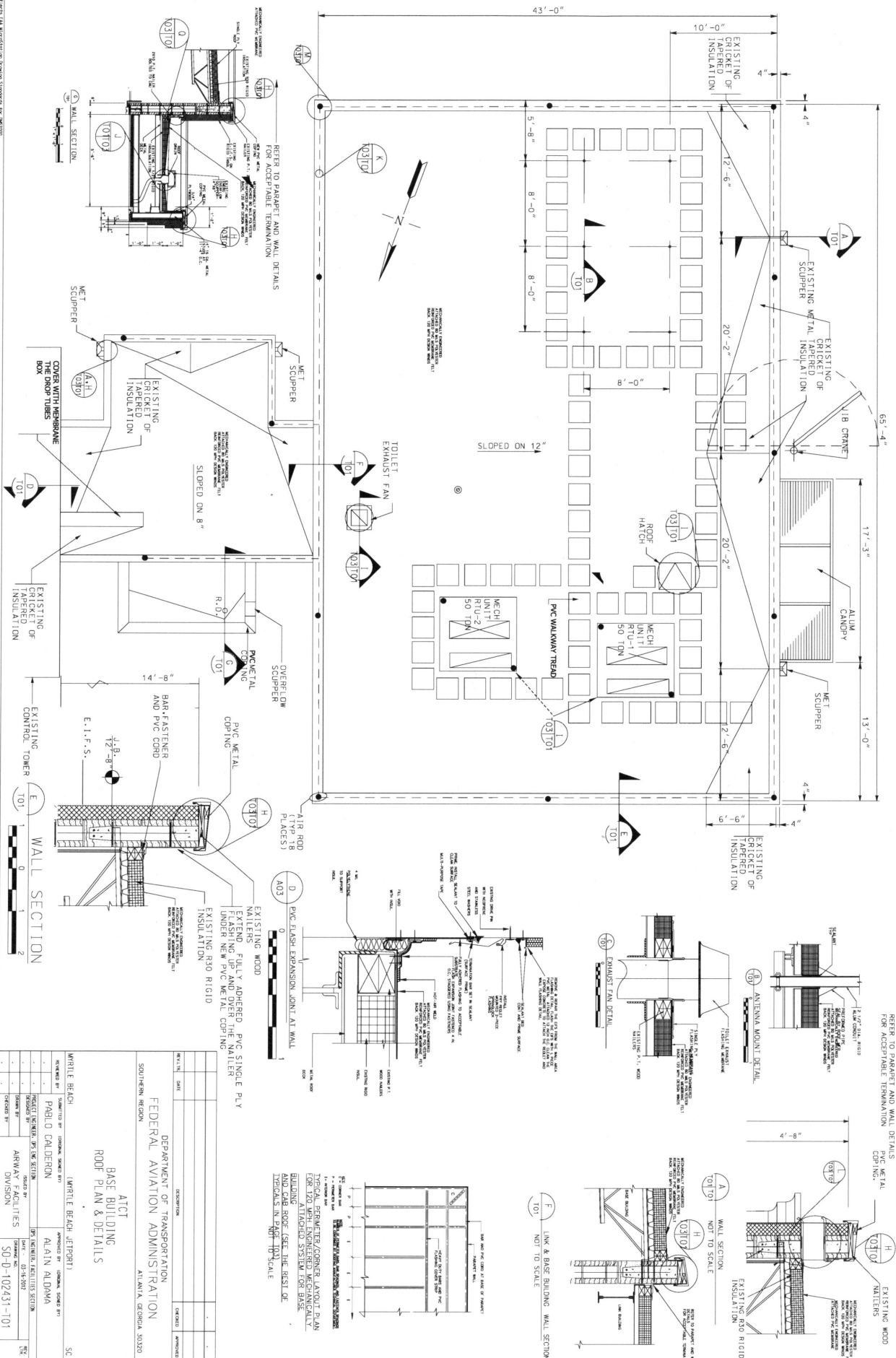
VIEW OF THE LINK AREA

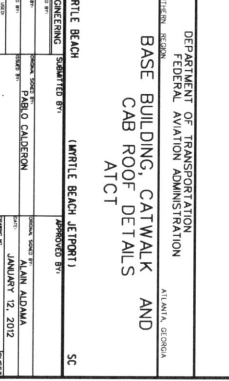
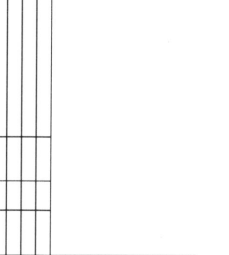
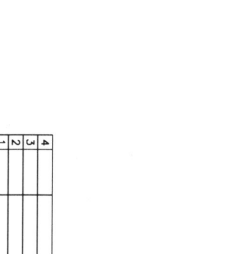
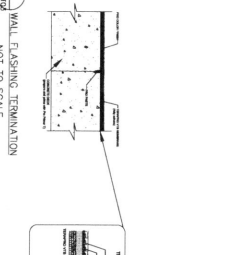
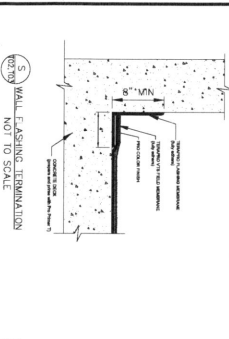
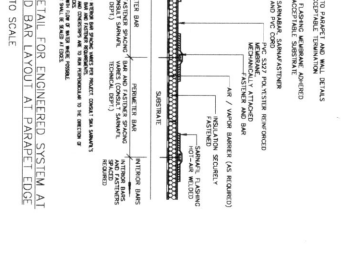
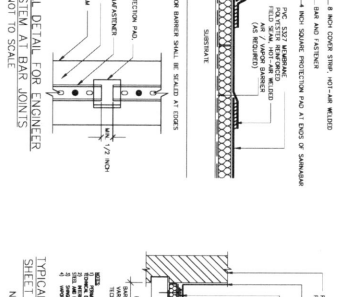
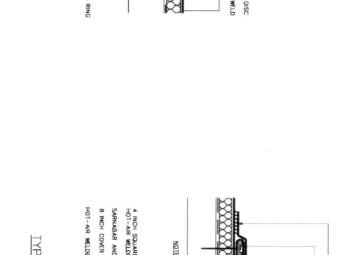
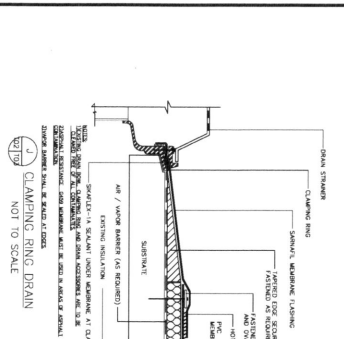
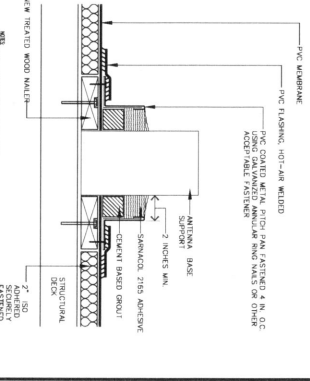
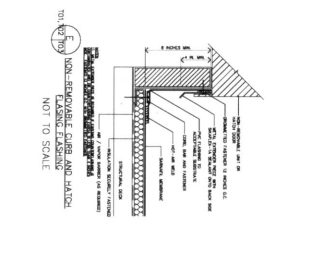
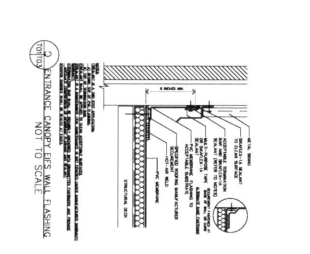
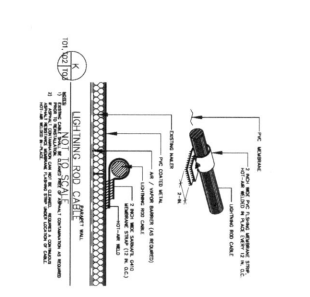
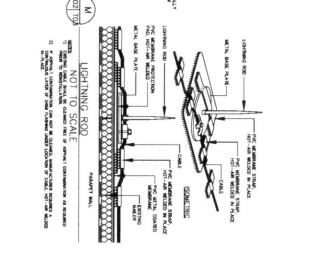
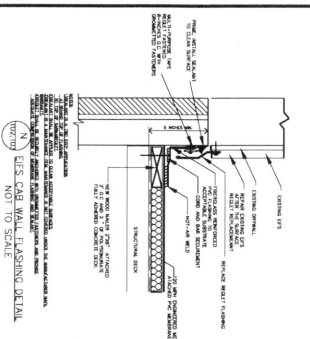
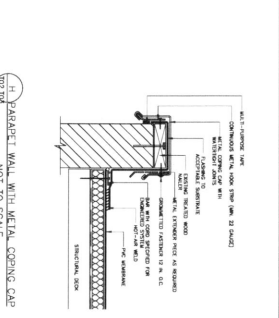
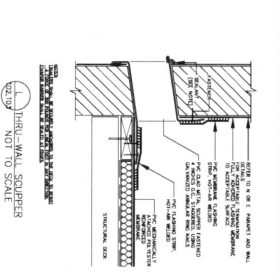
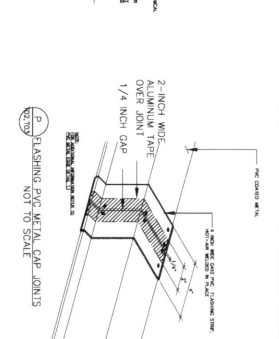
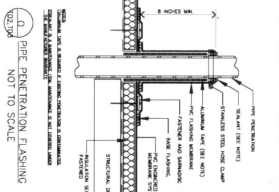
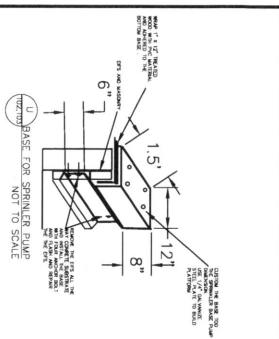


VIEW OF THE CAB ROOF WITH FLASHING SUPORT FOR THE ANTENNA BASE



TYPICAL VIEW OF THE INSIDE CAB ROOF PARAPET WALL





NO.	DESCRIPTION	DATE	BY	CHKD BY
1	REVISION			
2	REVISION			
3	REVISION			
4	REVISION			

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
ATLANTA REGION

BASE BUILDING, CATWALK AND
CAB ROOF DETAILS
ATCT

ENGINEER: [NAME]
DESIGNED BY: [NAME]
CHECKED BY: [NAME]
APPROVED BY: [NAME]

DATE: JANUARY 12, 2012
SHEET: 30-D-102431-103 OF 103

